

[The Galileo Affair](#)

Why did Galileo get in trouble with the Church?

Many theories have been put forth over the years to explain why Galileo came into conflict with the Church. The mystery arises precisely because Galileo actually stood squarely in the long history of the Church's support of science. Many churchmen of high standing, such as Cardinal Nicholas of Cusa, had suggested even more radical cosmologies than Galileo did; Copernicus' work itself had been available without controversy for more than sixty years before Galileo first published his telescopic observations. Most theories explain Galileo's problems with the Church as a clash of strong personalities; as coming from a fear that his ideas would threaten the basis of contemporary theology; or as a reaction by the Pope to the political pressures of the day.

The interpretation of the bible was certainly one of the principal contributing factors to the controversy. At the council of Trent, at the height of the protestant reformation just about twenty years before the birth of Galileo, the Catholic Church had solemnly declared that only the church could authentically interpret the bible and that private interpretation was forbidden. Now in 1616, just as the controversy about a sun-centered Copernican universe was heating up, the church's holy office declared that Copernicanism was formally heretical because it contradicted many passages in the bible (e.g. Joshua 10: 11-13, in which the sun stops moving in the sky). Galileo had already written several essays on the interpretation of the bible in which he essentially said that the bible was written to teach us how to go to heaven and not how the heavens go. In these documents he essentially anticipated by about 400 years what the Catholic Church would teach about the interpretation of the bible, but he did so privately.

In these documents and in many others Galileo certainly showed himself to be a person with an acerbic writing style who courted controversy. He also had friends in high places, including Prince Cesi, the head of the scientific "Academy of the Lynxes".

Unfortunately for Galileo, Prince Cesi died just before the controversy arose over Galileo's book: "Dialogue Concerning Two Chief World Systems" (Dialogue).

For many years Galileo had a close friendship with cardinal Maffeo Barberini who had even sent Galileo a latin ode composed by the cardinal in praise of Galileo's telescopic discoveries. This same cardinal became Pope Urban VIII, the reigning pontiff at the time of the church's condemnation of Galileo.

In the dialogue, Galileo provided persuasive, but not conclusive, evidence for a Sun-centered system. In so doing, he challenged the classical Greek philosophy of nature, which had dominated thinking about the universe for millennia. To embrace Copernicanism was to threaten Aristotelianism. The persistent requirement of fidelity to Aristotelianism had nothing to do with a Sun-centered system; rather, Aristotelianism was the basis for the philosophical and theological teachings of the time. If Aristotelian natural philosophy crumbled, some feared that the whole system of theology that it supported would also crumble.

In addition, the trial of Galileo occurred during the Thirty Years War, which entered a critical phase exactly at the time of the Galileo trial in 1632. The trial may have been a reaction to the political pressure being put on Pope Urban VIII by the Spanish (and others). By attacking Galileo, the Pope could be seen as showing the more conservative elements that he was not a radical. Perhaps also this was a veiled way of putting political pressure on the rich and powerful Medici family, who were Galileo's patrons, to stay out of choosing sides in that war.

Did the Jesuits train Galileo?

We know that Galileo, as a young teacher at Pisa, relied upon notes of Jesuits, which he obtained from the Roman College (a Jesuit institution). The Jesuits taught the Aristotelian nature philosophy, which today we call physics, but they were also open to new scientific discoveries. Galileo was a good friend of some Jesuits, including the famous Jesuit mathematician and astronomer, Christopher Clavius. When Galileo's first book, the "Starry Message," was published, Jesuits at the Roman College held a special symposium in his honor. At the request of Cardinal Bellarmine, himself a Jesuit, the Jesuit scientists at the Roman College were the first to corroborate Galileo's telescopic observations.

However, once he became famous with his writings, Galileo had a falling out with some Jesuits. This was driven at least in part by arguments of priority, as he felt that some Jesuit scientists who were publishing their own results about sunspots and comets were challenging his priority in these matters.

Was the Church anti-science in that time?

Not at all. Clergymen devoted a lot of their time to the study of the sciences even then. Many science books of that era were written by priests, such as Fr. Clavius (1538-1612) who was instrumental in the reform of the calendar, and Fr. Riccioli (1598-1671) who published the first modern map of the Moon and named craters on the Moon after Jesuits and other scientists, including Copernicus and Kepler.

~~~Turner's note: This is a biased response designed to make the church look good. In general the church supported scientific findings that fit with their predetermined views of the universe. They opposed any science that questioned or denied a literal reading of the bible and punished scientists who refused to change their results. They believed in witchcraft and opposed medical experimentation and study.

### **What is the Church position now?**

Even after the Galileo trial, the Copernican system was taught in Catholic schools; but it was presented as a mathematical system, not a philosophical description of the universe. By the mid 1700s, even that stricture was lifted, though Galileo's books themselves were listed on the *Index Librorum Prohibitorum* (List of Prohibited Books) for another half century.

When Pope Leo XIII wrote on the importance of science and reason, he essentially embraced the philosophical principles put forth by Galileo, and many statements by Popes and the Church over the years have expressed admiration for Galileo. For example, Galileo was specifically singled out for praise by Pope Pius XII in his address to the International Astronomical Union in 1952. Pope John Paul II named a commission to investigate again the Galileo affair; after the work of Galileo commission was completed, Pope John Paul II's discourse to the Pontifical Academy of science in 1992 stated that Galileo's sufferings at the hands of some individuals and church institutions were tragic and inescapable, and a consequence of a mutual incomprehension in those times between church theologians and the new scientists such as Galileo. To be clear, science as we know it was just being born and not even scientists of those times could comprehend fully what was happening. The Church officially apologized to Galileo in 2000. You can see Pope John Paul II's discourse of 1992 at:

[DISCORSO DI GIOVANNI PAOLO II AI PARTECIPANTI ALLA SESSIONE PLENARIA DELLA PONTIFICIA ACCADEMIA DELLE SCIENZE](#)

Was Galileo an atheist?

No, few people were in those days. In a private letter of Jan 20, 1610, Galileo writes: "I am infinitely grateful to God who has deigned to choose me alone to be the first to observe such marvelous things which have lain hidden for all ages past." Galileo had two daughters, and both became religious sisters.

## **The Crime of Galileo: Indictment and Abjuration of 1633**

Whereas you, Galileo, son of the late Vincenzo Galilei, of Florence, aged seventy years, were denounced in 1615, to this Holy Office, for holding as true a false doctrine taught by many, namely, that the sun is immovable in the center of the world, and that the earth moves, and also with a diurnal motion; also, for having pupils whom you instructed in the same opinions; also, for maintaining a correspondence on the same with some German mathematicians; also for publishing certain letters on the sun-spots, in which you developed the same doctrine as true; also, for answering the objections which were continually produced from the Holy Scriptures, by glozing the said Scriptures according to your own meaning; and whereas thereupon was produced the copy of a writing, in form of a letter professedly written by you to a person formerly your pupil, in which, following the hypothesis of Copernicus, you include several propositions contrary to the true sense and authority of the Holy Scriptures; therefore (this Holy Tribunal being desirous of providing against the disorder and mischief which were thence proceeding and increasing to the detriment of the Holy Faith) by the desire of his Holiness and the Most Eminent Lords, Cardinals of this supreme and universal Inquisition, the two propositions of the stability of the sun, and the motion of the earth, were qualified by the Theological Qualifiers as follows:

1. The proposition that the sun is in the center of the world and immovable from its place is absurd, philosophically false, and formally heretical; because it is expressly contrary to Holy Scriptures.
2. The proposition that the earth is not the center of the world, nor immovable, but that it moves, and also with a diurnal action, is also absurd, philosophically false, and, theologically considered, at least erroneous in faith.

Therefore . . . , invoking the most holy name of our Lord Jesus Christ and of His Most Glorious Mother Mary, We pronounce this Our final sentence: We pronounce, judge, and declare, that you, the said Galileo . . . have rendered yourself vehemently suspected by this Holy Office of heresy, that is, of having believed and held the doctrine (which is false and contrary to the Holy and Divine Scriptures) that the sun is the center of the world, and that it does not move from east to west, and that the earth does move, and is not the center of the world; also, that an opinion can be held and supported as probable, after it has been declared and finally decreed contrary to the Holy Scripture, and, consequently, that you have incurred all the censures and penalties enjoined and promulgated in the sacred canons and other general and particular constituents against delinquents of this description. From which it is Our pleasure that you be absolved, provided that with a sincere heart and unfeigned faith, in Our presence, you abjure, curse, and detest, the said error and heresies, and every other error and heresy contrary to the Catholic and Apostolic Church of Rome.

1630 A.D. [See note below. The date should be 1633]

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Important Note: I have been unable to locate a printed source for the above text. A different translation, with the text of Galileo's abjuration, was posted by Evan Soule, 10/18/1998 at <http://www.escribe.com/science/vortex/msg00017.html> . Again this is without a printed source, but with the correct date of 1633.

See the [Galileo Timeline](#) at Rice University

The following are excerpted portions from the

Sentence of the Tribunal of the Supreme Inquisition against Galileo Galilei, given the 22nd day of June of the year 1633

"It being the case that thou, Galileo, son of the late Vincenzo Galilei, a Florentine, now aged 70, wast denounced in this Holy Office in 1615:

"That thou heldest as true the false doctrine taught by many, that the Sun was the centre of the universe and immoveable, and that the Earth moved, and had also a diurnal motion: That on this same matter thou didst hold a correspondence with certain German mathematicians....

"That the Sun is the centre of the universe and doth not move from his place is a proposition absurd and false in philosophy, and formerly heretical; being expressly contrary to Holy Writ: That the Earth is not the centre of the universe nor immoveable, but that it moves, even with a diurnal motion, is likewise a proposition absurd and false in philosophy, and considered in theology ad minus erroneus in faith.....

"Invoking then the Most Holy Name of Our Lord Jesus Christ, and of His most glorious Mother Mary, ever Virgin, for this Our definite sentence, the which sitting pro tribunali, by the counsel and opinion of the Reverent Masters of theology and doctors of both laws, Our Counsellors, we present in these writings, in the cause and causes currently before Us, between the magnificent Carlo Sinceri, doctor of both laws, procurator fiscal of this Holy Office on the one part, and thou Galileo Galilei, guilty, here present, confessed and judged, on the other part:

"We say, pronounce, sentence, and declare, that thou, the said Galileo, by the things deduced during this trial, and by thee confessed as above, hast rendered thyself vehemently suspected of heresy by this Holy Office, that is, of having believed and held a doctrine which is false, and contrary to the Holy Scriptures, to wit: that the Sun is the centre of the universe, and that it does not move from east to west, and that the Earth moves and is not the centre of the universe: and that an opinion may be held and defended as probable after having been declared and defined as contrary to Holy Scripture; and in consequence thou hast incurred all the censures and penalties of the Sacred Canons, and other Decrees both general and particular, against such offenders imposed and promulgated. From the which We are content that thou shouldst be absolved, if, first of all, with a sincere heart and unfeigned faith, thou dost before Us abjure, curse, and detest the above-mentioned errors and heresies and any other error and heresy contrary to the Catholic and Apostolic Roman Church, after the manner that We shall require of thee.

"And to the end that this thy grave error and transgression remain not entirely unpunished, and that thou mayst be more cautious in the future, and an example to others to abstain from and avoid similar offences,

"We order that by a public edict the book of DIALOGUES OF GALILEO GALILEI be prohibited, and We condemn thee to the prison of this Holy Office during Our will and pleasure; and as a salutary penance We enjoin on thee that for the space of three years thou shalt recite once a week the Seven Penitential Psalms, reserving to Ourselves the faculty of moderating, changing, or taking from, all other or part of the above-mentioned pains and penalties.

"And thus We say, pronounce, declare, order, condemn, and reserve in this and in any other better way and form which by right We can and ought.

Ita pronunciamus nos Cardinalis infrascripti.

- F. Cardinalis de Asculo.
- G. Cardinalis Bentivolius
- D. Cardinalis de Cremona.
- A. Cardinalis S. Honuphri.
- B. Cardinalis Gypsius.
- F. Cardinalis Verospius.
- M. Cardinalis Ginettus.

GALILEO'S ABJURATION.

I, Galileo Galilei, son of the late Vincenzo Galilei of Florence, aged 70 years, tried personally by this court, and kneeling before You, the most Eminent and Reverend Lord Cardinals, Inquisitors-General throughout the Christian Republic against heretical depravity, having before my eyes the Most Holy Gospels, and laying on them my own hands; I swear that I have always believed, I believe now, and with God's help I will in future believe all which the Holy Catholic and Apostolic Church doth hold, preach, and teach.

But since I, after having been admonished by this Holy Office entirely to abandon the false opinion that the Sun was the centre of the universe and immoveable, and that the Earth was not the centre of the same and that it moved, and that I was neither to hold, defend, nor teach in any manner whatever, either orally or in writing, the said false doctrine; and after having received a notification that the said doctrine is contrary to Holy Writ, I did write and cause to be printed a book in which I treat of the said already

condemned doctrine, and bring forward arguments of much efficacy in its favour, without arriving at any solution: I have been judged vehemently suspected of heresy, that is, of having held and believed that the Sun is the centre of the universe and immovable, and that the Earth is not the centre of the same, and that it does move.

Nevertheless, wishing to remove from the minds of your Eminences and all faithful Christians this vehement suspicion reasonably conceived against me, I abjure with sincere heart and unfeigned faith, I curse and detest the said errors and heresies, and generally all and every error and sect contrary to the Holy Catholic Church. And I swear that for the future I will neither say nor assert in speaking or writing such things as may bring upon me similar suspicion; and if I know any heretic, or one suspected of heresy, I will denounce him to this Holy Office, or to the Inquisitor and Ordinary of the place in which I may be.

I also swear and promise to adopt and observe entirely all the penances which have been or may be by this Holy Office imposed on me. And if I contravene any of these said promises, protests, or oaths, (which God forbid!) I submit myself to all the pains and penalties which by the Sacred Canons and other Decrees general and particular are against such offenders imposed and promulgated. So help me God and the Holy Gospels, which I touch with my own hands.

I Galileo Galilei aforesaid have abjured, sworn, and promised, and hold myself bound as above; and in token of the truth, with my own hand have subscribed the present schedule of my abjuration, and have recited it word by word. In Rome, at the Convent della Minerva, this 22nd day of June, 1633.

I, GALILEO GALILEI, have abjured as above, with my own hand.

Scriptural References Relevant to the Trial of Galileo  
(King James Version of the Bible/ **Douay-Rheims Catholic Bible**)

**Joshua 10 (Verse 13):**

And the sun stood still, and the moon stayed, until the people had avenged themselves upon their enemies. Is not this written in the book of Jasher? **So the sun stood still in the midst of heaven**, and hasted not to go down about a whole day. [King James]

13 And the sun and the moon stood still, till the people revenged themselves of their enemies. Is not this written in the book of the just? **So the sun stood still in the midst of heaven**, and hasted not to go down the space of one day. [Catholic]

**Psalm 19 (Verses 1-5)**

1 The heavens declare the glory of God; and **the firmament sheweth his handywork**.  
2 Day unto day uttereth speech, and night unto night sheweth knowledge.  
3 There is no speech nor language, where their voice is not heard.  
4 Their line is gone out through all the earth, and their words to the end of the world. **In them hath he set a tabernacle for the sun,**  
5 **Which is as a bridegroom coming out of his chamber**, and rejoiceth as a strong man to run a race. [KJV]

**Psalm 104 (Verses 1-5)**

1 Bless the LORD, O my soul. O LORD my God, thou art very great; thou art clothed with honour and majesty.  
2 Who coverest thyself with light as with a garment: who stretchest out the heavens like a curtain:  
3 Who layeth the beams of his chambers in the waters: who maketh the clouds his chariot: who walketh upon the wings of the wind:  
4 Who maketh his angels spirits; his ministers a flaming fire:  
5 **Who laid the foundations of the earth, that it should not be removed for ever.** [KJV]

**Isaiah 40 (Verse 22):**

22 **It is he that sitteth upon the circle of the earth**, and the inhabitants thereof are as grasshoppers; **that stretcheth out the heavens as a curtain, and spreadeth them out as a tent to dwell in:** [King James]

22 It is he that sitteth upon the globe of the earth, and the inhabitants thereof are as locusts: **he that stretcheth out**

***the heavens as nothing, and spreadeth them out as a tent to dwell in.*** [Catholic]

Consultant's Report on Copernicanism  
(February 24, 1616)

*Catholic theologians were asked by the Roman Inquisition to evaluate the Copernican theory.*

*Their assessment follows:*

A decree of February 19, 1616, summoned Qualifiers of the Holy Office and required them to give their opinion on the two following propositions in Galileo's work on the solar spots. (The assessment was made in Rome, on Wednesday, February 24, 1616.)

Proposition to be assessed:

(1) The sun is the center of the world and wholly immovable from its place.

**Assessment:** This proposition was unanimously declared "foolish and absurd. philosophically and formally heretical inasmuch as it expressly contradicts the doctrine of the Holy Scripture in many passages, both in their literal meaning and according to the general interpretation of the Holy Fathers and the doctors of theology."

(2) The earth is not the center of the world, nor immovable, but it moves as a whole, also with diurnal motion.

**Assessment:** This proposition was unanimously declared "deserving of the like censure in philosophy, and as regards theological truth, to be at least erroneous in faith."

## **Isaac Newton: The Mathematical Principles of Natural Philosophy**

### **[Excerpts]**

*[The Rules of Reasoning in Philosophy]*

#### **RULE I**

*We are to admit no more causes of natural things, than such as are both true and sufficient to explain their appearances.*

To this purpose the philosophers say, that Nature does nothing in vain, and more is in vain, when less will serve; for Nature is pleased with simplicity, and affects not the pomp of superfluous causes.

#### **RULE II**

*Therefore to the same natural effects we must, as far as possible, assign the same causes.*

As to respiration in a man, and in a beast; the descent of stones in Europe and in America; the light of our culinary fire and of the sun; the reflection of light in the earth, and in the planets

#### **RULE III**

*The qualities of bodies, which admit neither intension nor remission of degrees, and which are found to belong to all bodies within reach of our experiments, are to be esteemed the universal qualities of all bodies whatsoever.*

For since the qualities of bodies are only known to us by experiments, we are to hold for universal, all such as universally agree with experiments; and such as are not liable to diminution, can never be quite taken away. We are certainly not to relinquish the evidence of experiments for the sake of dreams and vain fictions of our own devising; nor are we to recede from the analogy of Nature, which is wont to be simple, and always consonant to itself. We no other way know the extension of bodies, than by our senses, nor do these reach it in all bodies; but because we perceive extension in all that are sensible, therefore we ascribe it universally to all others, also. That abundance of bodies are hard we learn by experience. And because the hardness of the whole arises from the hardness of the parts, we therefore justly infer the hardness of the undivided particles not only of the bodies we feel but of all others. That all bodies are impenetrable we gather not from reason, but from sensation. The bodies which we handle we find impenetrables and thence conclude impenetrability to be a universal property of all bodies whatsoever. That all bodies are moveable, and endowed with certain powers (which we call the forces of inertia) or persevering in their motion or in their rest, we only infer from the like properties observed in the bodies which we have seen. The extension, hardness, impenetrability, mobility,

and force of inertia of the whole result from the extension, hardness, impenetrability, mobility, and forces of inertia of the parts: and thence we conclude that the least particles of all bodies to be also all extended, and hard, and impenetrable, and moveable, and endowed with their proper forces of inertia. And this is the foundation of all philosophy. Moreover, that the divided but contiguous particles of bodies may be separated from one another, is a matter of observation; and, in the particles that remain undivided, our minds are able to distinguish yet lesser parts, as is mathematically demonstrated. But whether the parts so distinguished, and not yet divided, may, by the powers of nature, be actually divided and separated from one another, we cannot certainly determine. Yet had we the proof of but one experiment, that any undivided particle, in breaking a hard and solid body, suffered a division, we might by virtue of this rule, conclude, that the undivided as well as the divided particles, may be divided and actually separated into infinity.

Lastly, if it universally appears, by experiments and astronomical observations, that all bodies about the earth, gravitate toward the earth; and that in proportion to the quantity of matter which they severally contain; that the moon likewise, according to the quantity of its matter, gravitates toward the earth; that on the other hand our sea gravitates toward the moon; and all the planets mutually one toward another; and the comets in like manner towards the sun; we must, in consequence of this rule, universally allow, that all bodies whatsoever are endowed with a principle of mutual gravitation. For the argument from the appearances concludes with more force for the universal gravitation of all bodies, than for their impenetrability, of which among those in the celestial regions, we have no experiments, nor any manner of observation. Not that I affirm gravity to be essential to all bodies. By their inherent force I mean nothing but their force of inertia. This is immutable. Their gravity is diminished as they recede from the earth.

*RULE IV*

*In experimental philosophy we are to look upon propositions collected by general induction from phenomena as accurately or very nearly true, notwithstanding any contrary hypotheses that may be imagined, till such time as other phenomena occur, by which they may either be made more accurate, or liable to exceptions.*

This rule we must follow that the argument of induction may not be evaded by hypotheses.

Isaac Newton, *The Mathematical Principles of Natural Philosophy*, trans. A. Motte (London, 1729). [Capitalization and spelling have been modernized.]